

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-21 (Cancelled).

Claim 22 (New): An optical information recording medium, comprising:  
data overlapping a visible second information on a first information to form a  
sequence of pits,  
the second information being expressed in a predetermined area in a radial direction  
and an angular direction on the optical information recording medium, and the second  
information being expressed according to a change of a pit width, a change of a pit length, or  
a change of width within only a portion of the length of the pit.

Claim 23 (New): The medium according to Claim 22, wherein the pit length varies in  
accordance with the second information on the basis of the first information.

Claim 24 (New): The medium according to Claim 22, wherein the second  
information is expressed by a positional information of a polar coordinate with respect to the  
optical information recording medium.

Claim 25 (New): The medium according to Claim 22, wherein the pit change based  
on the second information varies gradually according to a time axis.

Claim 26 (New): The medium according to Claim 25, wherein a transition area of the  
pit change based on the second information ranges from 0.1 mm to 1 mm.

Claim 27 (New): An optical information recording medium, comprising:

data overlapping a visible second information on a first information to form a sequence of pits,

the second information being expressed in a predetermined area in a radial direction and an angular direction on the optical information recording medium, the second information being expressed according to a change of a pit width, a change of a pit length, or a change of width within only a portion of the length of the pit,

a plurality of pits being formed so that the first information is expressed, and the second information is expressed by a pit having a pit width selected from predetermined plural widths, and

a watermark pattern or visible image of the second information being expressed on the optical information recording medium as the information signal is reproduced.

Claim 28 (New): The medium according to Claim 27, wherein the pit length varies in accordance with the second information on the basis of the first information.

Claim 29 (New): The medium according to Claim 27, wherein the second information is expressed by a positional information of a polar coordinate with respect to the optical information recording medium.

Claim 30 (New): The medium according to Claim 27, wherein the pit change based on the second information varies gradually according to a time axis.

Claim 31 (New): The medium according to Claim 30, wherein a transition area of the pit change based on the second information ranges from 0.1 mm to 1 mm.

Claim 32 (New): A method of duplicating a master optical information recording medium, the method comprising steps of:

recording data overlapping a visible second information on a first information on the master optical information recording medium by intermittently irradiating a laser beam to form a sequence of pits;

recording the second information in a predetermined area in a radial direction and an angular direction on the master optical information recording medium, wherein the second information is recorded according to a change of a pit width based on a change of power of the laser beam, a change of a pit length based on an on/off control of the laser beam, or a change of width within only a portion of the length of the pit based on a change in the vicinity of the on/off control of the laser beam; and

utilizing the master optical information recording medium in a duplication device to duplicate a recorded content of the master optical information recording medium on a second optical information recording medium.

Claim 33 (New): The method according to Claim 32, wherein the duplication device includes a stamper configured to impress the recorded content of the master optical information recording medium into the second optical information recording medium.

Claim 34 (New): The method according to Claim 32, wherein in the case where a regenerative signal obtained from the master optical information recording medium is binary-coded at a predetermined slice level so as to generate a binary-coded signal, an irradiation timing of the laser beam is corrected so that the binary-coded signal is variable on the basis of a predetermined basic period, and the pit length is varied in accordance with the second information on the basis of the first information.

Claim 35 (New): The method according to Claim 32, wherein the second information is expressed by a positional information of a polar coordinate with respect to the master optical information recording medium.

Claim 36 (New): The method according to Claim 32, wherein a power of the laser beam is modulated to be variable in accordance with the second information according to a time axis.

Claim 37 (New): The method according to Claim 34, wherein the irradiation timing of the laser beam is corrected according to a correction data stored in a correction data storing means.

Claim 38 (New): The method according to Claim 34, wherein a power of the laser beam is controlled so that the pit change based on the second information is gradually carried out according to a time axis.

Claim 39 (New): The method according to Claim 38, wherein a transition area of the pit change based on the second information ranges from 0.1 mm to 1 mm.

Claim 40 (New): An apparatus for duplicating an optical information recording medium, which records data overlapping a visible second information on a first information on a master optical information recording medium by intermittently irradiating a laser beam to form a sequence of pits, the apparatus comprising:

means for generating a positional information so that the second information is recorded in a predetermined area in a radial direction and an angular direction on the master optical information recording medium;

means for modulating a laser beam power so that the second information is recorded according to a change of a pit width based on a change of power of the laser beam, a change of a pit length based on an on/off control of the laser beam, or a change of width within only a portion of the length of the pit based on a change in the vicinity of the on/off control of the laser beam; and

means for duplicating a recorded content of the master optical information recording medium on a second optical information recording medium.

Claim 41 (New): The apparatus according to Claim 40, wherein the means for duplicating includes a stamper configured to impress the recorded content of the master optical information recording medium data into the second optical information recording medium.

Claim 42 (New): The apparatus according to Claim 40, wherein in the case where a regenerative signal obtained from the master optical information recording medium is binary-coded at a predetermined slice level so as to generate a binary-coded signal, an irradiation timing of the laser beam is corrected so that the binary-coded signal is variable on the basis of a predetermined basic period, and the pit length is varied in accordance with the second information on the basis of the first information.

Claim 43 (New): The apparatus according to Claim 40, wherein the second information is expressed by a positional information of a polar coordinate with respect to the master optical information recording medium.

Claim 44 (New): The apparatus according to Claim 40, wherein a power of the laser beam is modulated to be variable in accordance with the second information according to a time axis.

Claim 45 (New): The apparatus according to Claim 42, wherein the irradiation timing of the laser beam is corrected according to a correction data stored in a correction data storing means.

Claim 46 (New): The apparatus according to Claim 42, wherein a power of the laser beam is controlled so that the pit change based on the second information is gradually carried out according to a time axis.

Claim 47 (New): The apparatus according to Claim 46, wherein a transition area of the pit change based on the second information ranges from 0.1 mm to 1 mm.

Claim 48 (New): An apparatus for duplicating an optical information recording medium which records a first information signal on a master optical information recording medium by carrying out an on/off modulation of a laser beam source at a period of integer multiples of a predetermined basic period in accordance with data to be recorded, and which records a change from a predetermined light intensity level to other light intensity level, which is obtained from a micro equal interval step such that an inclination of the light

intensity becomes substantially linear with respect to a second information signal and time by changing a light intensity of the laser beam source, on the master optical information recording medium, the apparatus comprising:

- means for measuring a laser intensity of the modulated laser beam;
- means for controlling a driving signal of the modulated laser beam;
- means for measuring a characteristic of laser beam intensity with respect to a predetermined pair of amplitudes of the driving signal obtained by the measuring means and the control means;
- means for carrying out an invert operation of the characteristic to determine a driving amplitude corresponding to a certain light intensity, and storing a result, wherein in the characteristic inverting means storing a driving amplitude for making a desired light intensity output, the light intensity of the laser beam being directly controlled during a change by investigating a necessary driving amplitude;
- means for correcting a timing of the modulated signal in accordance with a light intensity level of the laser beam, the resultant regenerative signal of the master optical information recording medium being smoothly variable in a recording range where a recording light intensity changes so that the master optical information recording medium can be reproduced; and
- means for duplicating a recorded content of the master optical information recording medium on a second optical information recording medium.

Claim 49 (New): The apparatus according to Claim 48, wherein the means for duplicating includes a stamper configured to impress the recorded content of the master optical information recording medium into the second optical information recording medium.

Claim 50 (New): A method for duplicating an optical information recording medium which records a first information signal on a master optical information recording medium, and which records a change from a predetermined light intensity level to other light intensity level, which is obtained from a micro equal interval step such that an inclination of the light intensity becomes substantially linear with respect to a second information signal and time by changing a light intensity of the laser beam source, on the master optical information recording medium, and further includes a timing correcting step applied to the first information signal in accordance with a light intensity level, the method comprising steps of:

measuring a laser intensity of the modulated laser beam;

controlling a driving signal of the modulated laser beam;

measuring a characteristic of laser beam intensity with respect to a predetermined pair of amplitudes of the driving signal obtained by the measuring means and the control means, and carrying out an invert operation of the characteristic, and further, storing the invert operation value which is a driving signal corresponding to a certain light intensity, wherein the light intensity of the laser beam being directly controlled during a change by investigating a necessary driving amplitude;

determining a timing correction value relative to an intermediate light intensity level in a displacement period of linearly interpolating a timing value at a predetermined light intensity level, the resultant regenerative signal of the master optical information recording medium being smoothly variable in a recording range where a recording light intensity changes so that the master optical information recording medium can be reproduced; and

utilizing the master optical information recording medium in a duplication device to duplicate a recorded content of the master optical information recording medium on a second optical information recording medium.



Claim 51 (New): The method according to Claim 50, wherein the duplication device includes a stamper configured to impress the recorded content of the master optical information recording medium into the second optical information recording medium.